

CLAIMS

1. A planar dielectric line comprising:

a dielectric substrate;

first and second electrodes formed on the front surface of the dielectric substrate so as to face each other with a fixed space therebetween;

a first slot sandwiched between the first and second electrodes;

third and fourth electrodes formed on the rear face of the dielectric substrate so as to face each other with a fixed space therebetween; and

a second slot sandwiched between the third and fourth electrodes and disposed so as to face the first slot,

wherein, in a planar dielectric line where a high-frequency signal is propagated along the first and second slots, the width dimensions of the first and second slots are set to be different from each other.

2. A planar dielectric line as claimed in claim 1, wherein, when the relative dielectric constant  $\epsilon_r$  of the dielectric substrate is 20 or more and the wavelength of a high-frequency signal in the dielectric substrate is represented by  $\lambda_{g0}$ , the thickness dimension of the dielectric substrate is substantially in the range of 0.3 to 0.4  $\lambda_{g0}$ , the width dimension of one of the first and second slots is  $\lambda_{g0}/100$  or less, and the width dimension of the

other slot is set to be substantially  $\lambda_{g0}/10$ .

3. A planar dielectric line as claimed in claim 1 or 2, wherein an electronic part is connected to one of the first and second slots having a narrower width dimension.

4. A planar dielectric line as claimed in any one of claims 1 to 3, further comprising:

A third slot positioned on one end of the first slot and sandwiched between the first and second electrodes, and a fourth slot positioned on one end of the second slot, sandwiched between the third and fourth electrodes, facing the third slot, and having the same width dimension as the third slot, both provided on the dielectric substrate,

wherein the first and third slots are connected by using a first connection slot, the second and fourth slots are connected by using a second connection slot, and at least either of the first and second connection slots is constituted by a tapered slot having the width dimension of which gradually changes.

5. A planar dielectric line as claimed in claim 4, wherein, when the wavelength of a high-frequency signal being propagated along the first and second slots is represented by  $\lambda_g$ , the line length of the tapered slot is set to be substantially in the range of  $\lambda_g/4$  to  $\lambda_g/2$ .

6. A planar dielectric line as claimed in any one of claims 1 to 3, further comprising:

a third slot positioned on one end of the first slot and sandwiched between the first and second electrodes, and a fourth slot positioned on one end of the second slot, sandwiched between the third and fourth electrodes, facing the third slot, and having the same width dimension as the third slot, both provided on the dielectric substrate,

wherein the first and third slots are directly connected and the second and fourth slots are directly connected to constitute an impedance matching circuit.

7. A planar dielectric line as claimed in any one of claims 1 to 6, wherein, in at least one of the first and second electrodes and the third and fourth electrodes, a planar-type band-stop filter is provided around the first and second slots.

8. A high-frequency active circuit using a planar dielectric line as claimed in any one of claims 1 to 7.

9. A transmitter-receiver using a planar dielectric line as claimed in any one of claims 1 to 7.